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BRIEFER ARTICLES.

THE TRICHOME STRUCTURES OF ERODIUM CICUTARIUM.

(WITH FOURTEEN FIGURES)

THE results of observations made by the present writer on the trichomes of *Erodium* are so different from those recently published in this journal¹ that it has seemed worth while to present them in some detail. About four more or less distinct forms of trichomes were found, some of these are glandular, others non-glandular.

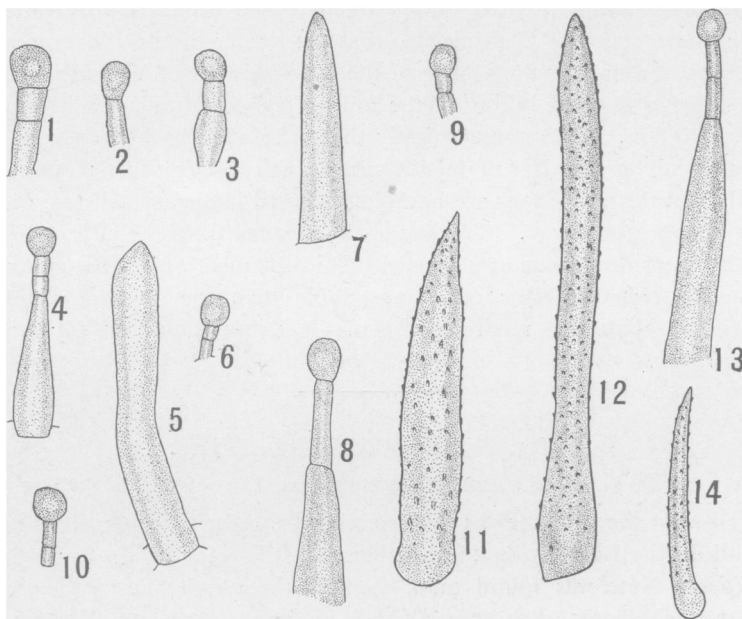
The trichomes of the hypocotyl are chiefly two to three-celled short filaments tipped with a bulbous glandular cell (*figs. 1, 2, 3*). Those of the cotyledon are various; thus the petiole bears some very short glandular hairs (*fig. 6*) smaller than those of the hypocotyl, also a kind with a long somewhat tapering basal cell (*fig. 4*). In addition to these glandular hairs there are some large unicellular hairs (*figs. 5, 7*) scattered here and there among the others. The blade of the cotyledon has in the basal sinus some of these same simple hairs. On other parts of the blade the hairs are glandular. Most of them are short (*fig. 9*), but there are also some longer ones (*fig. 8*) similar to some of those on the petiole (*fig. 4*).

The ordinary foliage leaves are somewhat different from the cotyledons in the trichomes they bear. The petioles have a great number of small glandular hairs (*fig. 10*), and in some specimens not a few longer hairs (*fig. 13*). Often these longer ones consist of five or six cells. In every case the proximal cell is far larger than the others. A thick-walled, rough tuberculate trichome (*fig. 11*) is also present. The leaves are pinnately divided and, as would be expected, the rachis has about the same trichome structures as the petiole. The long tuberculate form (*fig. 12*), however, is somewhat more common than the others, and is here longer than on the petiole. Sometimes these tuberculate structures are two-celled, but this is not a common occurrence. Scattered glandular hairs are also present like those seen on other parts (*figs. 8, 10*). The leaf blades bear many short tuberculate hairs. These are of different sizes. *Fig. 14* shows the most usual size and

¹ PRESTON, CARLETON E., Two instructive seedlings. BOT. GAZ. 33:150. 1902.

form, but some are like *figs. 11* and *12*. They are placed chiefly on the margin of the leaf blade and along the course of the vascular bundles. With them are many short, glandular hairs like those of the petiole (*fig. 10*).

It may be noted that Solereder² notes the presence of the glandular hairs which are here described and figured. He states that in *Ero-*



Trichomes of *Erodium cicutarium*: 1, 2, 3, from the hypocotyl; 4, 5, 6, 7, from the stalk of the cotyledon; 8, 9, from the blade of the cotyledon; 10, 11, from the leaf petiole; 12, from the rachis; 13, from the leaf petiole; 14, from the leaf blade; all $\times 170$.

dium, Geranium, and Pelargonium the cells of the stalk may be all alike or the basal one may be swollen to form a pedestal-like structure (*cf. figs. 9* and *10* with *8* and *13*).

Careful search was made both on the early and later leaves for trichomes with the form of *figs. 4, 8, and 13*, but with the basal cell thick-walled tuberculate. None were found on the material studied, although reported in the paper previously cited. Beside this difference in my own and Mr. Preston's results there are many others. He states

² SOLEREDER, Syst. Anat. d. Dicotyledonen. p. 193. 1899.

that the only modified epidermal structure of the cotyledon is the multicellular glandular hair (represented by my *fig. 8*), while I found all those shown in my *figs. 4-9*. He did not examine the hypocotyl.

By consideration of his results Mr. Preston builds up a theory of the phylogeny of these trichome structures which at once falls to the ground in view of the results reached by me. It seems scarcely worth while to propound theories of phylogeny based on a few observations on a single species. I think also that the theory of the above named writer to account for the lobing of the cotyledons is of no great value. He suggests that the lobing of the foliage leaf is "thrown back" upon the cotyledon. This assumes firstly that "throwing back" can actually occur, while as a matter of fact it yet remains to be proven; and secondly that the cotyledons are homologous with leaves, something which also remains unproven. The suggestion³ concerning the morphology of the cotyledon made at the recent Chicago meeting of botanists of the central states seems more reasonable than the one which would consider the cotyledon as really a leaf.—FRANCIS RAMALEY, *University of Colorado*.

TWO FERN MONSTROSITIES.

(WITH FIVE FIGURES)

DURING the summer of 1900 two remarkable fern monstrosities were found on the Laurel ridge, in northern West Virginia. *Asplenium pinatifidum* Nutt. was found on a spot on the north side of the rocky cañon of Decker's creek, at an altitude of about 1400 feet. There were not a dozen plants, all told, and none of them were quite normal. The species is abundant and typical four miles to the north, across the Cheat. The three accompanying figures illustrate the variability of the Decker's creek material, and will describe the fronds better than words can do. Individual fronds on most, but not on all, of the plants were typical, and insure the determination. Fruiting fronds had normal sori. There were no rooting tips. The region is rather rich in ferns, but I could not find *Camptosorus* in the immediate neighborhood. The "*Asplenium ebenoides*" described by C. E. Waters in *Fern Bulletin* of January 1902, with three different fronds on one plant, is remarkably like this monstrosity.

³LYON, HAROLD L., The phylogeny of the cotyledon. To be published in *Postelsia*, Annual of the Minnesota Seaside Station, season of 1891.